

Subject: Notes from Monday's Phone Meeting

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Hi Guys,

Here is a short summary of the things we talked about at yesterday's phone meeting with Marco, Jocelyn, and Georg. The meeting was more informational than for planning, so these notes don't contain any new action items not distributed at last week's cooling meeting.

Stave Fitting Notes:

1. Aluminum Fitting will be exact same dimensions as CuNi fitting, but in aluminum (obviously). They are currently planning to coat the fittings entirely with a layer of Ni.
2. Current gasket is pure In, 200 microns thick. It is smashed to a thickness of approximately 20 microns during tightening. Displaced In squishes out radially into annular gap between threaded collar and fitting.
3. New gasket will be Cu, 200 microns thick, with 10-20 microns of In vacuum deposited on both sides. This has not yet been tested.
4. Flatness and roughness of CuNi fittings is about 10 microns. However, they don't pay any special attention to this requirement.
5. Fittings are tightened by hand, then the collar is turned approximately 90 degrees further. This results in an approximate (observed) torque of 1 N-m.
6. Fitting thread (as per drawings) is 8x0.75 mm. This thread will not be changed for the aluminum fittings.
7. These aluminum (Ni coated) fittings will be brazed to tubing for the test procedure.
8. Testing (vac, pressure, etc.) may begin in early January (at current schedule).

Stave Joining Techniques:

1. Laser welding (6060 to 6060) is still having problems with micro-cracking. Vendor does not appear able to solve this.
2. E-beam welding has had mixed results, so they are making fittings with new features to deal with this (aluminum).
3. Brazing (torch) has problems of softening the ends of the tube (large Heat Affected Zone). They have broken 2 of 4 samples through mishandling. Induction brazing worked well at CERN, but the current vendor prefers the use of torch brazing.

Our Responsibilities to Stave Effort:

1. Agreed to try laser tests at EB with their 6060 tubes and fittings (Eric V. will send these soon). They have been warned that the similar alloys are unlikely to work.

-Neal